



## Global Journal of Medicine and Public Health

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### Menstruation and menstrual hygiene among adolescent girls of West Bengal, India: A school based comparative study

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#### ABSTRACT

**Background:** Adolescents are often less informed, less experienced, and less comfortable accessing reproductive health information and services than adults. In many developing countries, a culture of silence surrounds the topic of menstruation and related issues; as a result many young girls lack appropriate and sufficient information regarding menstrual hygiene. This may result in incorrect and unhealthy behaviour during their menstrual period. **Objectives:** To assess and compare knowledge, belief, ideas, source of knowledge and practice of menstrual hygiene between school-going adolescents in an urban and a rural school of West Bengal, India. **Methods:** Cross-sectional, descriptive study was conducted among adolescent female students of Howrah district of West Bengal, India in the year 2011. Data was collected by pre-designed, pre-tested semi-structured self administered questionnaire. **Results:** The mean age at menarche was 12.1 years among urban and 12.2 years among the rural participants. More than 80% participants had some restrictions imposed during menstruation. Significantly higher number of urban girls had pre-menarchal knowledge on menstruation and used sanitary napkins. **Conclusions:** Menstrual hygiene is a vital aspect of health education for adolescent girls. For improvement of menstrual hygiene, sanitary napkins should be made universally available and affordable.

**Keywords:** Menstrual hygiene, sanitary napkin, adolescent girl, reproductive health

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Funding: None

Conflict of interest: None

#### Introduction:

Adolescence in girls is a phase of transition from girlhood to womanhood and marks the onset of female puberty. This period of attaining reproductive maturity between the ages of 10-19 years is marked by a number of physiological, behavioral and psychological changes, the most notable being the onset of menstruation.<sup>1</sup> Age at menarche varies widely across the world and within the same region differences can be noted depending on nutritional and socio-economic status. Studies in India have shown mean age at menarche to vary from 12.3 years in Bengali girls to 15.4 years in girls of lower socio-economic status of Western India.<sup>2,3</sup> Implications of a girl's response to menarche are not only restricted to current and future health concerns but also have a socio-cultural and religious significance. Despite

advancements in the understanding of its biology, menstruation remains a phenomenon much shrouded by myths and taboos in certain sections of the society.

As every stage of a woman's health influences the next stage, menstrual hygiene is an important component of adolescent health in females, as poor menstrual hygiene can potentially be a cause of urinary tract infections, reproductive tract infections and sexually transmitted diseases like cervical cancer, HIV/AIDS.<sup>4</sup> Untreated reproductive tract infections (RTIs) can have severe consequences on the health, fertility and productivity of a woman. It also influence infant health and survival by causing fetal wastage and prenatal infection.<sup>5,6</sup>

Though the adolescents form about one-fifth of the

total population, yet their reproductive and sexual health needs remain largely unaddressed and unmet. Gender-insensitive school cultures, lack of menstrual protection and safe and private sanitation point towards a lack of political and administrative will to acknowledge menstrual hygiene as a problem.<sup>7</sup> Behavior and practices that a girl adopts during menstruation is largely influenced by a heterogeneous milieu of socio-economic, cultural and religious determinants coupled with her education. With this background, the present study was undertaken to assess and compare knowledge, belief, ideas, source of knowledge and practice of menstrual hygiene between school-going adolescents in an urban and a rural school of West Bengal, India.

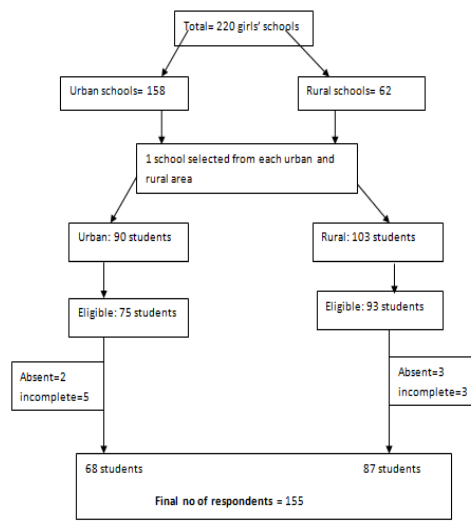
### Materials and Methods:

**Study Design and Setting:** We conducted a comparative, descriptive study with cross-sectional design among adolescent school students of Howrah district of West Bengal, India in the year 2011. There are total 220 girls' high schools in Howrah district; which were stratified by their location into rural and urban strata. There were 158 urban schools and 62 rural schools. One school was randomly selected from each stratum. The urban school was in Shibpur area under Howrah municipality and the rural school was under the Begri Panchayet of Domjur block. Both schools were Government sponsored Bengali medium schools affiliated to West Bengal Board of Secondary Education. The school authorities were intimated and informed about the purpose of the study and study dates were fixed.

**Sampling Methodology and sample size:** Students of classes VII to X who had attained menarche were included in the study. Out of 90 students of the urban school, 75 students and out of 103 rural students, 93 met the eligibility criteria. On the day of the visit 5 eligible students were absent and 8 questionnaires were rejected due to incompleteness of the response. So the final numbers of respondents were 68 in urban and 87 in rural school respectively. Selection and recruitment of study subjects is shown in figure 1.

**Tools and technique:** The study tool was pre-designed, pre-tested semi-structured questionnaire in vernacular (in Bengali). Questionnaire included questions regarding background characteristics of respondents, knowledge, awareness about menstruation, source of information and practices followed to maintain menstrual hygiene. Average time required to fill up the questionnaire was about 30 minutes. This was followed by a session educating the girls about the normal physiology of menstruation, the importance of maintaining hygiene and safe hygienic practices during menstruation. Questions and concerns of the participants were also addressed at the end of the

Figure 1 Selection and recruitment of study subjects



session. No follow-up visit was planned to track the absentees to maintain the confidentiality of the questionnaire and truthfulness of the responses.

**Ethical issues:** Study protocol was approved by institutional ethics committee of Medical College, Kolkata. The students were explained about the purpose of the study, voluntary participation and confidentiality policy.

**Data Analysis:** The responses were compiled in Excel spreadsheet and were analyzed by using Epi Info™ Version 3.5.1.  $\chi^2$  test was applied to test for significance of association.

### Results:

Total 155 students participated in the study, of which 68 were from an urban school and 87 from a rural school. All the participants were unmarried females, aged between 11 to 18 years and students of classes VII, VIII, IX and X. Maximum number of girls in both urban (66.2%) and rural area (62.1%) belonged to the age group 14-16 years. Mean age of all participants was 13.9 years (S.D= 1.0 years). Mean age in urban area was 14.2 years (S.D=1.3 years) and in rural area was 13.8 years. (S.D=0.8 years). In urban area majority (72.1%) followed Islam, while in the rural area 82.8% were Hindus. Most of the study population lived in nuclear families in both urban (52.9%) and rural areas (67.8%). Almost half of the respondents in both urban and rural area belonged to lower socio-economic status (Class IV & V of Prasad Scale).<sup>8</sup> Mean ages at menarche was 12.1 years among urban participants and 12.2 years among the rural participants. For all participants 29.3 days was the average duration of menstrual cycle and the mean duration of last menstrual period were 5.4 days.

Table 1: Socio-demographic profile of the study population

Socio-demographic profile		Urban (n=68)	Number (%)	Rural (n=87)	Number (%)
Age group (in years)	10-13	21 (30.9)		33 (37.9)	
	14-16	45 (66.2)		54 (62.1)	
	17-19	2 (2.9)		0 (0.0)	
Class in which read	VII	16 (23.5)		0 (0.0)	
	VIII	18 (26.5)		33 (37.9)	
	IX	22 (32.4)		29 (33.3)	
	X	12 (17.6)		25 (28.7)	
Religion	Hinduism	19 (27.9)		72 (82.8)	
	Islam	49 (72.1)		15 (17.2)	
Type of family	Joint family	32 (47.1)		28 (32.3)	
	Nuclear family	36 (52.9)		59 (67.8)	
Socio-economic status	Class I	11 (16.2)		11 (12.6)	
	Class II	14 (20.6)		13 (14.9)	
	Class III	15(22.1)		18 (20.7)	
	Class IV	12(17.6)		32 (36.8)	
	Class V	16 (23.5)		13 (14.9)	
Literacy of father	Illiterate	3 (4.4)		4 (4.6)	
	Primary	17 (25.0)		23 (26.4)	
	Middle school	19 (27.9)		18 (20.7)	
	Secondary	16 (23.5)		15 (17.2)	
	Higher secondary	8 (11.8)		13 (14.9)	
	Graduate	5 (7.4)		9 (10.3)	
	Post graduate	0 (0.0)		5 (5.7)	
Literacy of mother	Illiterate	3 (4.4)		2 (2.3)	
	Primary	22 (32.4)		21 (24.1)	
	Middle school	27 (39.7)		29 (33.3)	
	Secondary	10 (14.7)		19 (21.8)	
	Higher secondary	3 (4.4)		9 (10.3)	
	Graduate	3(4.4)		6 (6.9)	
	Post graduate	0 (0.0)		1 (1.1)	

Table 2 shows associated symptoms with periods and imposed restrictions. Majority of them experienced some kind of symptoms associated with last menstrual periods. Pain in abdomen was the most common associated symptom among both urban (86.7%) and rural (90.9%) students, followed by weakness (46.7% in urban and 28.8% in rural area). Itching around genitalia, headache, nausea/vomiting and breast pain were the other associated symptoms. 85.3% of urban girls had some form of restriction imposed during menstruation while it was 80.5% among the rural girls. Most of the participants in both urban (54.4%) and rural (76.1%) areas refrained from religious activities, followed by absenteeism from school (45.6%) and playing (40.4%) in urban area and absenteeism from school (33.8%), restriction of food (22.5%) and sleeping separately (22.5%) in rural area. Some others restricted doing household chores

and attending marriages.

Absenteeism from school was mainly due to pain in abdomen and excessive bleeding in both urban and rural population.

72.1% of the urban participants and 39.1% rural girls had pre-menarchal knowledge on menstruation ( $p < 0.01$ ). Friends (65.3%) and mothers (36.7%) were the main informants in urban area and school curriculum (55.9%) in rural area. 60.3% of girls in urban area and 54% girls in rural area mentioned menstruation to be a natural phenomenon. 1.5% in urban area and 9.2% in rural area said uterus to be the source of menstrual blood, while others marked urinary bladder, vagina or abdomen to be the sources of menstrual blood.

Both in urban (73.5%) and rural (62.1%) areas, participants reported 12 years to be the normal age of menarche.

Table 2: Distribution of study population according to associated symptoms and imposed restrictions during menstruation

Variables	Urban (n=68) Number (%)	Rural (n=87) Number (%)
Associated Symptoms*	(n = 60)	(n = 66)
Pain in abdomen	52 (86.7)	60 (90.9)
Headache	6 (10.0)	4 (6.1)
Nausea/Vomiting	4 (6.7)	3 (4.5)
Weakness	28 (46.7)	19 (28.8)
Excessive bleeding	18 (26.5)	14 (16.1)
Breast pain	2 (3.3)	2 (3.0)
Itching around genitalia	9 (15.0)	6 (9.1)
Types of restrictions*	(n = 58)	(n = 70)
Household chores	13 (22.8)	8 (11.3)
Religious activities	31 (54.4)	54 (76.1)
Attending marriages	10 (17.5)	2 (2.8)
Playing	23 (40.4)	11 (15.5)
School	26 (45.6)	24 (33.8)
Sleeping separately	16 (28.1)	16 (22.5)
Food	9 (15.8)	16 (22.5)

\* Multiple responses

Table 3: Distribution of study population according to knowledge and perception regarding menstruation

Knowledge about menstruation	Urban (n=68) Number (%)	Rural (n=87) Number (%)	Significance
Pre-menarchal knowledge about menstruation			
No	19 (27.9)	53 (60.9)	$\chi^2=16.69$ df=1,P=0.00001
Yes	49 (72.1)	34 (39.1)	
Cause of menstruation			
Natural	41 (60.3)	47 (54.0)	$\chi^2=0.61$ df=1 P= 0.43
Curse from God	2 (2.9)	0 (0.0)	
A disease	2 (2.9)	2 (2.3)	
Due to weight gain	1 (1.5)	1 (1.1)	
Don't know	22 (32.4)	37 (42.5)	
Source of menstrual blood			
Uterus	1 (1.5)	8 (9.2)	$\chi^2=2.87$ df=1 P= 3.09
Urinary bladder	23 (33.8)	12 (13.8)	
Vagina	12 (17.6)	10 (11.5)	
Abdomen	10 (14.7)	11 (12.6)	
Kidney	0 (0.0)	2 (2.3)	
Don't know	22 (32.4)	44 (50.6)	
Ideal absorbent during menstruation			
Sanitary napkin	65 (95.6)	80 (92.0)	$\chi^2=0.34$ df=1, P= 0.55
Old cloth	0 (0.0)	3 (3.4)	
New cloth	3 (4.4)	4 (4.6)	

Table 4: Distribution of study population according to practices during menstruation

Practices during menstruation	Urban (n=68) Number (%)	Rural (n=87) Number (%)	Significance
Absorbent used during menstruation Sanitary napkin only Others (old cloth, new cloth, mixed)	50 (73.5) 18 (26.5)	40 (45.9) 47 (54.1)	$\chi^2=11.9$ Df=1 p < 0.001
Reuse of absorbent No Yes	56 (82.3) 12 (17.7)	52 (59.7) 35 (40.3)	$\chi^2=9.21$ , Df=1, p=0.002
Number of times changed 1 2-4 5-6	14 (20.6) 52 (76.5) 2 (2.9)	6 (6.9) 79 (90.8) 2 (2.3)	$\chi^2=6.53$ Df=2, p=0.038
Place of storage of absorbent Bathroom Cupboard Separate bag Any other	29 (42.6) 23 (33.8) 12 (17.7) 4 (5.9)	45 (51.7) 16 (18.4) 12 (13.8) 14 (16.1)	$\chi^2=8.06$ Df=3, p=0.044
Disposal of absorbent Bathroom Bury in ground Public Dustbin With domestic refuse Others (Roadside & burning)	4 (5.9) 7 (10.3) 47 (69.1) 9 (13.2) 1 (1.5)	4 (4.6) 20 (23.0) 39 (44.9) 23 (26.4) 1 (1.1)	$\chi^2=10.6$ Df=3, p=0.014
Drying of used absorbent Inside house with sunlight Inside house without sunlight Outside house with sunlight Outside house without sunlight	(n=12) 2 (16.6) 4 (33.4) 3 (25.0) 3 (25.0)	(n=35) 8 (22.8) 16 (45.6) 6 (17.3) 5 (14.3)	$\chi^2=1.37$ Df=3, p=0.711
Cleaning of genitalia Do not clean During bathing Every time with toilet	5 (7.4) 22 (32.4) 41 (60.3)	4 (4.5) 45 (51.8) 38 (43.7)	$\chi^2=5.88$ Df=2, p=0.05
Agent used for cleaning of genitalia Water Soap and water	(n=63) 27 (42.9) 36 (57.1)	(n=83) 43 (51.8) 40 (48.2)	$\chi^2= 1.15$ , df=1, p=0.283
Place of bathing (bathroom used) No Yes	3 (4.4) 65 (95.6)	14 (16.1) 73 (83.9)	$\chi^2= 4.20$ , df=1, p=0.04

Maximum number of participants in urban (39.7%) as well as rural (62.1%) areas felt 3-5 days as the normal duration of menstrual period. Most of the girls in urban area (35.4%) responded to 21-25 days as the normal duration of a menstrual cycle whereas 62.1% of the rural participants felt 26-30 days to be the correct duration of the cycle. 95.6 % participants in urban area and 92% participants in rural area felt sanitary napkin to be the ideal absorbent during menstruation. 73.5% of urban participants and 45.9% rural respondents used only sanitary napkin during menstruation. Most of the respondents (76.5% in

urban area and 90.8% in rural area) changed absorbent two to four times a day. 75% urban respondents and 79.3% rural respondents changed absorbent at night. Dustbin was the most commonly used place of disposal of used absorbent in both urban (69.1%) and rural (44.9%) areas. 12.6% participants in rural and 7.4% in urban area refrained from bathing during menstruation. The use of bathroom as place of bathing was found to be significantly higher (P=0.04) in urban area. Most girls opined that wearing of sanitary napkin was comfortable and absorption was adequate. However

they also remarked sanitary napkins were expensive and not available everywhere.

**Discussion:**

Knowledge, attitude and practices related to menstruation have strong roots in the socio-cultural environment. In this study we have tried to explore the status of menstrual hygiene and also compare the ideas and beliefs on menstruation between urban and rural girls. A study by Drakshayani Devi et al in rural Andhra Pradesh, the age of menarche was 12 – 13 years which is in agreement with the present study.<sup>9</sup>

This is also similar with the study by Dasgupta et al (2008) but lower than 13.7 years as reported from Rohtak (2011).<sup>10,11</sup>

Age at menarche is dependent on genetic, psychological and nutritional factors. These factors vary with different study settings. Most of the participants experienced symptoms associated with periods. 86.7 % of the study population suffered from dysmenorrhoea which was higher than that reported from the slums of Delhi, rural Maharashtra and suburbs of Tehran.<sup>12,13,14</sup>

Table 5: Distribution of study population according to perception regarding advantages and disadvantages of sanitary napkins

Perception regarding sanitary napkins	Urban (n=68) Number (%)	Rural (n=87) Number (%)	Significance
Advantages *			
Comfortable	28 (41.2)	32 (36.8)	$\chi^2=21.27$ df=4, p=0.0002
Adequate absorption	20 (29.4)	51 (58.6)	
Do not stain clothes	25 (36.8)	14 (16.1)	
No itching	7 (10.3)	3 (3.5)	
Don't know	3 (4.4)	14 (16.1)	
Disadvantages *			
Expensive	28 (41.2)	43 (49.4)	$\chi^2=8.21$ df=2, p=0.016
Not available everywhere	18 (26.4)	7 (8.0)	
Don't know	30 (44.1)	39 (44.8)	

\* Multiple responses

About 72% urban girls and 39% rural girls were found to have pre-menarcheal knowledge regarding menstruation, while this number was nearly 97% in a study carried out in Kano, Nigeria and 92% in Nepal.<sup>15,16</sup> 64% of Gujjar girls and 67% in rural Bengal in India had partial knowledge regarding menstruation. In a study at Nigeria, 35.3% had parents as informants while school teacher or matron served to be informant in 14.3% cases.<sup>10,15,17</sup> The Gujjar girls however had this information mostly from friends (83%).<sup>17</sup> In a study carried out in South India (2010), mothers were informant in 54% cases and friends in 35.3% cases.<sup>18</sup> More than 90% participants had knowledge regarding use of sanitary napkin as ideal absorbent. This was found nearly similar to 86.5% in Kano.<sup>15</sup> Much lower percentage of girls thought menstruation to be a natural phenomenon compared to studies in Nepal (81%) and rural Bengal (86.5%).<sup>10,16</sup> Knowledge on biology of menstruation was poor in many studies. Only 1.5% in urban area and 9.2% in rural area said uterus to be the source of menstrual blood, this compared well with a previous study which found that 2.5% of respondents knew the source to be uterus while a study from rural Nepal shows 25.3% to have correct knowledge regarding source of menstrual blood.<sup>10,19</sup> Notably studies from India report lower proportion of girls

having correct knowledge on menstruation. Sources of information were mass media, mothers or friends. Secondary school curriculum in many states of India does not include information on menstruation; even at family level silence surrounds the issue of menstruation, which can explain comparatively lower knowledge in the Indian studies. The number of girls using sanitary napkins was found to be much higher than studies in rural Maharashtra (15.67%) and urban South India (68.9%)<sup>11,12</sup>. It is documented that use of sanitary napkin is higher in urban area which is possibly due to interplay of number of factors like availability, accessibility, cost (real or perceived), exposure to mass media, local customs as well as storage and disposal issues. Most of the girls in urban (76.5%) and rural (90.8%) areas practiced changing their pads 2-4 times a day, which compares well with the study in South India.<sup>18</sup> Practice of changing absorbent while in school was practiced infrequently. This observation was similar to that by Omidvar and Begum (2010).<sup>18</sup> Cleanliness of genitalia was found to be satisfactory (those who cleaned at every visit to toilet) in 60.3% urban and 43.7% rural girls, which was more than that found by Mudey et al (2010).<sup>13</sup> Soap and water were used as cleaning agents by 57% urban and 50 % rural girls which was similar to the findings by Mudey et al (2010) but differed much

from the study of Dasgupta and Sarkar.<sup>10,13</sup> Availability of water for cleaning is a crucial issue in this regard. Many household in India do not have separate bathroom or continuous water supply; this problem is more acute in rural areas. Taboos and superstitions regarding menstruation are prevalent in both urban and rural areas, as restrictions were practiced in urban and rural areas alike, with maximum restriction on religious activities. Similar finding was reported in rural Bengal (2008) and urban adolescents of Rohtak.<sup>10, 11</sup> Such familiarity between different studies and differing study settings testifies for the universality of negative attitude towards menstrual hygiene.

**Conclusion:**

The urban and rural girls in our study had very similar demographic characteristics. Our study finding did not show much difference for menstruation status, knowledge and practice between urban and rural areas. However pre-menarchal knowledge about menstruation, exposure to mass media, use of bathroom and use of sanitary napkin was considerably higher among urban adolescents. Three main problem areas identified in this study were poor knowledge on biology of menstruation, majority of girls having symptoms associated with menstruation and low use of sanitary napkin. "Anwasha Clinic" (clinic for adolescent in India) can play an important role in improving knowledge and treating symptoms. Sanitary napkins can also be made available through Anwasha clinic. Government of India has proposed a scheme on June 15, 2010 for providing subsidized sanitary napkins to rural adolescent girls for promoting menstrual hygiene.<sup>20</sup> Schools should be another entry point for improving menstrual health by integrating menstrual hygiene into curriculum, provision of toilets and even supplying sanitary napkin. Menstrual health is an important part of life cycle approach to women's health, so loud and clear messages and services on this issue must reach adolescent girls.

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